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Wellington:—Statistics of the Colony of New Zealand. 1887. Folio. *Wellington* 1888; Reports of the Mining Industries. 1888. Folio. *Wellington*.
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March 28, 1889.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "The Structural Arrangement of the Mineral Matters in Sedimentary and Crystalline Pearls." By GEORGE HARLEY, M.D., F.R.S. Received March 6, 1889.

[Publication deferred.]

II. "On the descending Degenerations which follow Lesions of the Gyrus marginalis and Gyrus fornicatus in Monkeys." By E. P. FRANCE. With an Introduction by Professor SCHÄFER, F.R.S (from the Physiological Laboratory, University College, London). Received March 9, 1889.

(Abstract.)

This paper contains a minute account of the descending degenerations which have been observed to make their appearance in the lower portions of the central nervous system, as the result of artificially established lesions of parts of the cerebral cortex. The work has been carried out by Mr. France with material supplied by the researches of Professor Horsley, Dr. Sanger Brown, and Professor Schäfer,

which have been published in the 'Philosophical Transactions' (vol. 179). It is illustrated partly by representations of certain of the brains showing the extent of the lesions, partly by photographs of microscopic sections through the spinal cord and medulla oblongata.

III. "On certain Ternary Alloys. I. Alloys of Lead, Tin, and Zinc." By C. R. ALDER WRIGHT, D.Sc., F.R.S., Lecturer on Chemistry and Physics, and C. THOMPSON, F.C.S., F.I.C., Demonstrator of Chemistry, in St. Mary's Hospital Medical School. Received March 5, 1889.

It is well known, that quite apart from a tendency to separate more or less completely into different mixtures during solidification, certain mixtures of molten metals show a tendency to separate into two alloys of different densities on standing fused for some time. Lead and zinc and bismuth and zinc have been shown by Matthiessen and von Bose ('Roy. Soc. Proc.,' vol. 11, p. 430) to form two such mixtures. We find that aluminium and zinc or aluminium and bismuth also behave in the same way. In each case two different alloys are formed, one consisting of the heavier metal with a little of the lighter one dissolved therein, the other of the lighter metal containing a small quantity of the heavier one.

On the other hand, *tin* will alloy indefinitely in all proportions with any one of the four metals, lead, bismuth, zinc, or aluminium, the mixtures exhibiting no particular tendency to separate into two different alloys on simply remaining at rest in a fused condition, although in certain cases more or less separation is apt to occur *during solidification*, owing to partial formation of eutectic alloy. On quickly cooling a mass of 60 to 80 grams of mixed metal, fused in a small narrow crucible and kept molten for some hours, an ingot is obtained, the highest and lowest portions of which exhibit sensibly the same composition on analysis; no more difference being observed than may reasonably be attributed to surface oxidation and volatilisation whilst standing molten, and to incipient formation of eutectic alloy during the act of solidification. Thus the following figures were obtained with two ingots of zinc and tin, and similarly in the other cases:—

	Zinc.	Tin.	Zinc.	Tin.
Top layer	31·13	68·87	61·14	38·86
Bottom layer	31·37	68·63	60·54	39·46
Mean	31·25	68·75	60·84	39·16